

SECTION III.—FORECASTS.

STORMS AND WARNINGS FOR DECEMBER.

By EDWARD H. BOWIE, District Forecaster.

[Dated, Washington, Jan. 15, 1915.]

At the beginning of the month high-pressure areas were over the New England coast and the eastern Rocky Mountain region, while pressure was low over the Rio Grande Valley, western Ontario, and on the extreme North Pacific coast.

The northeastern high area passed eastward and gave place to lower pressure in connection with the western Ontario low area, while the high area over the eastern Rocky Mountain region moved northeastward to Quebec, where it persisted until the 7th.

The Rio Grande Valley storm moved slowly northeastward to southern Mississippi by the morning of the 3d and on the evening of that date there were two centers, one poorly defined over western Tennessee, where it persisted for several days, and the other over Alabama. The latter center moved slowly eastward, on the morning of the 7th being central east of Hatteras with increased intensity. By the following morning it had passed to the southern New England coast, and by the 9th was over the Banks of Newfoundland, having caused general precipitation over the Gulf States and territory east of the Mississippi River. On the 4th storm warnings were ordered for the Atlantic coast from Cape Henry to Cape Cod and repeated on the 5th and 6th for the area indicated and extended to Eastport. Warnings were again repeated on the 7th. This was one of the severest storms of record and caused phenomenally high tides and high winds and rains along the Middle Atlantic seaboard. Considerable property damage was done along the Delaware and New Jersey coasts.

An offshoot from a storm of moderate intensity that prevailed over the North Pacific coast from the 2d to 5th, was central over southwestern Utah on the morning of the 5th, and thence moved southeastward to the mouth of the Rio Grande during the next 48 hours. It passed thence eastward across the Gulf of Mexico and, recurving over Florida, passed north-northeastward between the Atlantic coast and Bermuda to a position near Newfoundland by the morning of the 11th. This storm passed northeastward in the trough of the preceding low. Precipitation attended this disturbance over the Mississippi Valley and thence eastward. This disturbance, in connection with the high-pressure that prevailed along the northern border necessitated warnings of high winds on the 8th for Lakes Michigan, Superior, and Huron.

From the 5th to the 10th pressure was high over the northern border. The high-pressure area that prevailed at the beginning of this period was reinforced by several different high areas from Canada, the most important being that of the 8th from Alberta which moved southeastward to the northern Gulf States and thence eastward and northeastward to the Canadian Maritime Provinces. Freezing temperatures occurred over the East Gulf and south Atlantic States, with frost as far south as central Florida, warnings of which were successfully issued.

A low-pressure area on the north Pacific coast gave off an offshoot that was central over southern Utah on the 11th, whence it passed southeastward to the mouth of the Rio Grande and thence eastward and northeastward across the Gulf States and up the Atlantic coast with greatly increased intensity in the trough of a storm that passed east-southeastward from western Ontario on the 12th to Lake Huron on the evening of the 13th. The southern storm on the morning of the 13th was near Pensacola, and on the following morning over Maine, with pressure reading at Greenville 29.00 inches. It thence moved slowly northeastward, its influence continuing over the Canadian Maritime Provinces until the 16th. Precipitation occurred over much of the country with heavy rains in Atlantic coast districts and heavy snows in portions of the Appalachian Mountains, the upper Ohio Valley and lower Lake region and parts of New York and New England for which warnings were previously issued. Storm warnings were ordered for the Gulf and south Atlantic coast on the 12th, on the Atlantic coast on the 13th, and again on the New England coast on the 14th, and winds of gale force occurred as indicated.

This storm was followed by a high-pressure area that first appeared over Alberta on the night of the 11th. An offshoot from this high area moved slowly southward to Idaho. On the 14th this offshoot had two centers, one over the northern Plains States and the other over Oklahoma. On the following morning a single center was over western Tennessee, and during the 24 hours following moved east-northeastward to West Virginia where it remained stationary until the 17th, when it was reinforced by another high area that first appeared over Saskatchewan on the 14th. The combined high moved northeastward to a position south of Nova Scotia by the 19th. Cold weather was general throughout the country in connection with these high areas and the line of zero temperatures extended as far south as central Kansas and the mountain districts of Virginia, and freezing temperatures were reported throughout the Gulf and South Atlantic States, warnings being issued previous to their occurrence. Frost warnings were also issued in California and frosts occurred as indicated, but with little if any damage reported.

The next low appeared over northern Manitoba on the 17th, and passed thence eastward to the Canadian Maritime Provinces by the 20th. Quite general precipitation attended this disturbance over the eastern half of the country.

The high area following was an offshoot from a high that came from British Columbia during the 17th. An eastward extension of this high was over Nebraska on the 19th and thence passed rapidly eastward to a position south of Nova Scotia by the 21st.

On the 17th a disturbance was off the northern California coast and on the following morning an offshoot from it was over northern Arizona and southwestern Colorado, where it remained until the 20th, during which day an offshoot from it moved to northeastern Arkansas, and on the morning of the 21st was north of Lake Erie as a secondary to a storm central northeast of Lake Superior.

These two centers passed rapidly eastward, and on the 22d were over the Grand Banks, having caused rains in southern and snows in central and northern districts from the southern Rocky Mountain region and Plains States eastward. On the 21st warnings for high winds were disseminated to Atlantic coast ports from Sandy Hook northward, and high winds occurred as indicated therein.

Another disturbance followed from Alberta, passing rapidly across the northern border to the Gulf of St. Lawrence by the 23d.

Following these lows another high appeared over British Columbia on the 20th, and an extension from it passed southeastward to northern Texas by the 21st, and thence slowly eastward to Tennessee by the 23d. It moved thence northeastward to the middle Atlantic coast by the 24th, and during the next 12 hours passed off the coast. On the 20th cold wave warnings were issued for portions of the Plains States. On the 21st cold-wave warnings were ordered for the northern portion of the west Gulf States, and warnings of frosts and freezing temperatures for the middle and west Gulf States, and on the 22d cold-wave warnings were issued for the interior of New England and northern New York. The warnings of the 20th and 22d were followed by changes in conformity with the advices. Those issued on the 21st, for portions of the Gulf States, failed of verification on account of the weather becoming cloudy and precipitation occurring. Freezing temperature, however, occurred over the northern portions of the district referred to.

This high was followed by a low that on the 23d was over southern Alberta, whence it passed eastward to the Grand Banks by the 25th. Another low appeared on the extreme South Pacific coast on the 22d and during the next two days advanced to southern New Mexico. It thence moved rapidly eastward to the east Gulf States by the 25th and was then forced southeastward and southward with decreasing intensity until by the 27th there remained only slight indications of a cyclonic circulation off the east Florida coast. The suppression of this low was caused by a high pressure area that on the evening of the 23d was over eastern Saskatchewan. By the 25th it had moved to North Dakota with some of the lowest temperatures reported thus far this season. On the following morning it was over Illinois and another high area had appeared over western New York. The high with a single center was off the New England coast on the following morning, and pressure was high over the entire Atlantic seaboard, remaining so until the evening of the 28th. The low temperatures accompanying these high areas were felt quite generally throughout the country, the line of freezing temperatures extending southward nearly to the Gulf coast.

The next low to cross the country developed in the trough of a North Pacific storm and on the 27th was over

Arizona, a center at the same time being also over Alberta. By the 29th the southern center was over northeastern Missouri with increased intensity, and by the evening of the 30th it was over the Canadian Maritime Provinces. General precipitation in the form of rain in southern and snow in northern districts occurred in connection with this disturbance from the Plains States eastward. On the 28th storm warnings were ordered for the Gulf and on the following day for the Atlantic coast, and a number of stations reported the occurrence of high winds.

It was followed by a high area that first appeared over Saskatchewan on the 29th. Another center, an offshoot from the Pacific Ocean high, being at the same time over southern Idaho. The Canadian high moved southeastward to the Missouri Valley by the 30th and to Kentucky by the last of the month, while the Idaho high moved very slowly southeastward to northwestern New Mexico. Warnings of freezing temperatures were issued for the interior of Texas on the 29th, and temperatures occurred as indicated. On the evening of the 28th and the morning of the 29th cold wave warnings were ordered for almost the entire country from the Plains States eastward to the Appalachian Mountains, and on the 30th warnings were issued for New England and New York. Decided changes to colder weather occurred as indicated in the advices.

At the close of the month a low-pressure area was over Manitoba and the pressure was below normal and falling on the North Pacific coast. High pressure obtained from the St. Lawrence Valley to the middle Gulf coast, and the pressure was also high from Idaho to New Mexico.

NORTHERN HEMISPHERE PRESSURE.

Alaska.—Pressure averaged much above normal for all of Alaska except in the vicinity of Nome, where it averaged below normal. The greatest excess was in the area comprising Valdez and Sitka. Lows occurred about the 1, 3, 5-6, 8, 11, 15-16, 17-18, 22, 27, and 29-31; and highs about the 3-4, 7, 9-10, 12-14, 16-17, 18-19, 24, and 28-29. The storm on the first day of the month caused a great deal of damage in the vicinity of Nome, the Bering Sea ice pack being forced high up on shore and the water driven farther inland than for several years. The trails were reported impassable.

Honolulu.—Pressure averaged decidedly below normal, being continuously below the seasonal average from the 4th to 23d. The principal lows occurred about the 7, 9-10, 11-12, 13-14, 17, 20, and 26. The principal highs occurred about the 1, 23, and 30-31.

Azores.—Pressure averaged slightly above normal. Lows occurred on the 6, 10, 13, 27, and 29-30; and highs on the 2-4, 16, 18, 20-21, 23-24, 28, and 30-31.

Reports from Iceland and Siberia are not available.